

## COMMUNICATION SYSTEM ACTIVATION

### INVENTORS

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#### 1. Field of the Invention.

The invention is in the field of communications and in particular the invention concerns activation or wake-up signals for a communication system.

#### 2. Related Art.

Electronic communication between two or more remote locations has become a common method for exchanging information. In fact, the popularity in modern communication systems has strained the ability of communication service providers to meet the infrastructure requirements and provide the support systems for modern communication systems. For example, installation and operation of numerous such as hundreds or thousands of communication devices at a communication service providers central office requires large amounts of power and electronic device cooling capacity. Such power costs become expensive and may limit growth or profits.

In addition, existing communication facilities, in which the communication systems are installed, are already built-out. Renovating or remodeling a communication facility to accommodate additional power feeds or additional cooling capability may also limit growth or profits.

Moreover, users demand that modern communication systems provide higher rates of information transfer. Often the higher data transfer rates must occur over existing infrastructure, such as twisted pair copper. Communication cabling is often installed in bundles of conductors that are installed underground or overhead. Because  
5 the cabling is bundled together the individual conductors are adjacent other conductors. As a result, signals traveling on one line may generate electrical fields that effect communication on the other lines in the bundle. This effect can be problematic as data transfer rates increase and the number of conductors in the bundle that are in use at any one time also increases.

10 Hence, as the number of conductors in use in the bundle for data communication increases so to does the signal sensitivity that each conductor is carrying. These two factors operate against each other to present challenges to communication service providers attempting to provide high-speed communication services.

As a result of these situations that arise from the popularity of high-speed  
15 communication systems there exists a need for methods and apparatus to overcome such drawbacks. As described below in greater detail, the methods and apparatus described below provide solutions to alleviate these and other problems.

### SUMMARY

The invention may be implemented in various embodiments. In one embodiment a sequence signal is provided to serve as a wake-up signal. Use of a sequence signal provides advantages over signals of the prior art by overcoming the effects of noise and requiring less power during transmission. These advantages result in a high success rate of wake-up signal detection and a lower rate of false detects.

In one embodiment an apparatus for restoring operation of a communication system after a period of inactivity is provided. The communication system comprises at least a first communication device and a second communication device and the system comprises a sequence generator located at the first communication device and configured to generate a sequence signal upon request to initiate communication after a period of inactivity. A transmitter is located at the first communication device and is configured to transmit the sequence signal to the second communication device. The sequence signal is intended to initiate operation of the second communication device. A receiver located at the second communication device may be configured to receive the sequence signal. A correlator connects to the receiver and correlates the received sequence signal. A signal processor located at the second communication device is configured to process the correlated signal to determine if the received signal is a sequence signal that signals a request to initiate operation.